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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/824,675

04/14/2004

Robert O. Conn

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10/06/2005

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EXAMINER

KANG, DONGHEE

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 10/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/824,675

Applicant(s)

CONN, ROBERT O.

Examiner

Donghee Kang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-10 is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Upon further consideration of the restriction requirement mailed 07-06-05, the examiner withdraws his restriction requirement, and the following rejection is set forth.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims **1-2, 4 & 5-9** are rejected under 35 U.S.C. 102(b) as being anticipated by Hayashi et al. (US 4,980,308).

Re claim **1**, Hayashi teaches an integrated circuit die, comprising (Fig.2):

a device wafer portion having a face side surface, the device wafer portion comprising a semiconductor wafer portion (21) and an interconnect portion (2, 38 & 39), the interconnect portion having a surface that is the face side surface of the device wafer, the semiconductor wafer portion comprising a source region (35sa) of a first conductivity type (P+) and a drain region (35da) of the first conductivity type (P+) and a channel structure of a second conductivity (N-) type opposite the first conductivity type, wherein the source region, the drain region and the channel structure are part of a single layer of a semiconductor material and together form an island of the semiconductor material; and a supporting structure portion (1) that is bonded to the face

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side surface of the device wafer portion, wherein the island extends outward from a back side of the interconnect portion opposites the face side surface of the device wafer portion..

Re claim 2, Hayashi teaches the island of semiconductor material has a substantially planar bottom surface, the source region having a bottom surface that makes up a part of the substantially planar bottom surface of the island, the drain region having a bottom surface that makes up another part of the substantially planar bottom surface of the island, wherein the planar bottom surfaces of the source and drain regions are not in contact with any semiconductor material of the semiconductor wafer portion of the device wafer (See Fig.2B).

Re claim 4, Hayashi teaches the supporting structure is a semiconductor wafer that is wafer-bonded to the face side surface of the device wafer portion (Col.2, lines 64-66).

Re claim 5, Hayashi teaches the semiconductor wafer portion of the device wafer comprises a plurality of islands, each of the islands comprising a source region, a drain region, and a channel structure.

Re claim 6, Hayashi teaches the source region has a substantially no junction capacitance other than a junction capacitance between the source region and a channel structure.

Re claim 7, Hayashi teaches the island consists essentially of the source region, the drain region and the channel structure.

Claim Rejections - 35 USC § 103

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4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al. (US 4,980,308) in view of Matsumoto et al. (US 6,794,717).

Hayashi teaches substantially the claimed structure as explained claims 1 & 8 above, except that the channel structure has a key-shape. Matsumoto teaches in Fig.9 the channel structure has a key-shape. This key-shape may reduce an area covering an edge of an active region hence a gate capacitance can be reduced. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form key-shape channel structure as taught by Matsumoto in Hayashi's device since this key-shape channel reduce area covering an edge of an active region so as to reduce gate capacitance.

Allowable Subject Matter

6. Claims 8-10 are allowed.

Response to Arguments

7. Applicant's arguments filed 5-2-05 have been fully considered but they are not persuasive.

Applicant argues that Hayashi does not disclose or teach the island extending outward from a back side surface of the interconnect portion. This is not convincing.

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Hayashi clearly in Fig.2B teach the island (35sa, 33A, & 35da) extending outward from a back side surface of the interconnect portion (39).

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghee Kang whose telephone number is 571-272-1656. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Loke can be reached on 571-272-1657. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Donghee Kang
Primary Examiner
Art Unit 2811

dhk